REMARKS

By the foregoing amendment, Claims 1, 19 and 23 have been amended. It is believed that the amendments introduce no new matter, and introduce no new issues requiring further consideration and/or search. Favorable reconsideration of the application is respectfully requested.

The Examiner objected to Claim 1 at lines 16-17, indicating that the word "with" should read "and," and Claim 1 has been amended in accordance with the Examiner's suggestion.

Claims 1-3, 5-13, 16-21, 23-31 and 34-36 were rejected under 35 U.S.C. §112, second paragraph, on the grounds of indefiniteness. The Examiner indicated that there was insufficient basis in Claim 1 for the phrase "the optical input/output connectors of the first and second mass storage modules," in that the optical input/output connectors are recited to be on the module bypass circuit boards of the first and second mass storage modules, and not directly on the mass storage modules. Claim 1 has been amended in accordance with the Examiner's suggestion to recite "the optical input/output connectors of the module bypass circuit boards."

The Examiner indicated that there was insufficient basis in Claim 19 for the phrase "the optical input/output connectors of the first and second mass storage modules," and Claim 19 has been amended to recite "the optical input/output connectors of the module bypass circuit boards" and to provide antecedent basis therefor.

The Examiner also noted that Claim 23 depended from Claim 22 which had been cancelled. Claim 23 has accordingly been amended to depend from Claim 19. It is therefore believed that the rejection of Claims 1-3, 5-13, 16-21, 23-31 and 34-36 on the grounds of indefiniteness should now be withdrawn.

Claims 1-3, 5, 7 and 10-13 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al., and Swanson et al. Leshem was cited as teaching a high speed mass storage system with at least one module containing at least one CPU, and as teaching a controller providing a communication path between the CPU with some of the storage devices through an associated storage bypass circuit board.

Claim 1 recites "wherein the optical input/output connectors of the module bypass circuit boards of the first and second mass storage modules are connected by a fiber optic transmission medium." The Examiner acknowledged that Leshem does not teach a module bypass circuit board including an optical input/output connector for outputting electrical signals from the module as light signals and for inputting light signals into the module as electrical signals. The Examiner cited Espy as teaching optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium, referring to Espy at page 2, line 29 to page 3, line 6, and page 6 lines 7-16, mentioning a Fibre Channel, which however in Espy is not a fiber optic transmission medium. At page 6, line 28 to page 7, line 3, Espy teaches that a twinax cable 18 is a standard cable for Fibre Channel, and includes four wire conductors. Espy

clearly does not teach, disclose or suggest optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium.

The Examiner asserted that Swanson et al. teaches a module bypass circuit board including an optical input/output connector for outputting electrical signals from the module as light signals and for inputting light signals into the module as electrical signals. Swanson et al. only teaches a module that is an optical transceiver, not a module bypass circuit board, as claimed.

The Examiner asserted that column 1, lines 19-42 of Swanson et al. teaches optical transmission provides large capacity for digital transmission in computer/communication networks. However, Swanson et al. only teaches optical transmission for "large capacity digital transmission in communication networks, such as public telecommunications networks." Swanson et al. does not teach, disclose or suggest optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium, such as for a high speed mass storage system as in the present invention.

The Examiner further asserted that Hillis teaches optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium, and that it would be obvious to modify the system of Leshem with the system of Hillis. The Examiner referred to Figs. 5 and 6, and column 10, line 59 to column 11, line 5; column 11, lines 29-33; and column 11, lines 34-51. Hillis teaches cabinets 500 each containing circuit boards 430 that are connectable to mass storage modules 470. The cabinets 500 are interconnected via communications modules 505 via fiber optic

communications lines. However, Hillis contains no disclosure, teaching or suggestion that the communications modules 505 are module bypass circuit boards. The Examiner acknowledged that Leshem does not teach mass storage modules including a storage device bypass circuit board. Therefore, modifying the system of Leshem with the system of Hillis would not result in the invention as claimed.

None of the references disclose, teach or suggest optical input/output connectors of module bypass circuit boards of first and second mass storage modules connected by a fiber optic transmission medium. It is therefore respectfully submitted that Claims 1-3, 5, 7 and 10-13 are novel and inventive over Leshem, Espy, Hillis, Dekoning, et al. and Swanson et al., taken individually or together, and that the rejection of Claims 1-3, 5, 7 and 10-13 on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al., and Swanson et al. should be withdrawn.

Claims 6, 16, 19-21, 23, 24, 28-31 and 34 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al. Swanson et al. and Harvey. Regarding Claim 6, Harvey was cited as disclosing a module including a storage device bypass board connector for each of the storage device bypass circuit boards with an opening between each connector to permit air flow between the connectors for cooling purposes to prevent overheating of the drive and related hardware. Regarding Claim 16, Harvey was also cited as disclosing a module including a disk drive bypass circuit board connector for each of the disk drive bypass circuit boards, with an opening between each connector to permit flow of air between the connectors and alongside the bypass circuit boards and disk drives for cooling purposes.

Claims 6 and 16 depend from Claim 1. It is respectfully submitted that Harvey does not teach, disclose or suggest optical input/output connectors of module bypass circuit boards of first and second mass storage modules connected by a fiber optic transmission medium, as is claimed. It is therefore respectfully submitted that Claims 6 and 16 are novel and inventive over Leshem, Espy, Hillis, Dekoning, et al. Swanson et al. and Harvey.

As to Claim 19, Leshem was cited as teaching a high speed mass storage system with at least one module containing at least one CPU.

Claim 19 also recites "wherein the optical input/output connectors of the module bypass circuit boards of the first and second mass storage modules are connected by a fiber optic transmission medium such that signals are communicated between the modules in the form of light." The Examiner acknowledged that Leshem does not teach a module bypass circuit board including an optical input/output connector for outputting electrical signals from the module as light signals and for inputting light signals into the module as electrical signals. The Examiner cited Espy as teaching optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium. The Examiner referred to Espy at page 2, line 29 to page 3, line 6, and page 6 lines 7-16, mentioning a Fibre Channel, which however in Espy, as noted above, is not a fiber optic transmission medium. At page 6, line 28 to page 7, line 3, Espy teaches that a twinax cable 18 is a standard cable for Fibre Channel, and includes four wire conductors. Espy clearly does not teach, disclose or suggest optical

input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium.

The Examiner asserted that Swanson et al. teaches a module bypass circuit board including an optical input/output connector for outputting electrical signals from the module as light signals and for inputting light signals into the module as electrical signals. As noted above, Swanson et al. only teaches a module that is an optical transceiver, not a module bypass circuit board, as claimed.

The Examiner asserted that Hillis teaches optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium, and that it would be obvious to modify the system of Leshem with the system of Hillis. The Examiner referred to Figs. 5 and 6, and column 10, line 59 to column 11, line 5; column 11, lines 29-33; and column 11, lines 34-51. Hillis teaches cabinets 500 each containing circuit boards 430 that are connectable to mass storage modules 470. The cabinets 500 are interconnected via communications modules 505 via fiber optic communications lines. However, Hillis contains no disclosure, teaching or suggestion that the communications modules 505 are module bypass circuit boards. The Examiner acknowledged that Leshem does not teach mass storage modules including a disk drive bypass circuit board. Therefore, modifying the system of Leshem with the system of Hillis would not result in the invention as claimed.

The Examiner further asserted that column 1, lines 19-42 of Swanson et al. teaches optical transmission provides large capacity for digital transmission in computer/communication networks. However, as noted above, Swanson et al. only

teaches optical transmission for "large capacity digital transmission in communication networks, such as public telecommunications networks." Swanson et al. does not teach, disclose or suggest optical input/output connectors of first and second mass storage modules connected by a fiber optic transmission medium, such as for a high speed mass storage system as in the present invention.

The Examiner cited Harvey as teaching a disk drive bypass circuit board associated with each disk drive and including a disk drive connector at one edge thereof and a bypass board connector at another edge thereof, with each disk drive being plugged into the disk drive connector on the disk drive bypass circuit board. However, Harvey does not teach, disclose or suggest optical input/output connectors of module bypass circuit boards of first and second mass storage modules connected by a fiber optic transmission medium, as is claimed.

It is therefore respectfully submitted that Claims 6, 16, 19-21, 23, 24, 28-31 and 34 are novel and inventive over Leshem, Espy, Hillis, Dekoning, et al., Swanson et al. and Harvey, taken individually or together, and that the rejection of Claims 6, 16, 19-21, 23, 24, 28-31 and 34 on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al., Swanson et al. and Harvey should be withdrawn.

Claims 8, 9, 17, 18, 25-27, 35 and 36 were rejected under 35 U.S.C. 103(a) on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al., Swanson et al., Harvey and Kimura et al. As to Claim 8, the Examiner indicated that Leshem, Espy, Hillis, Dekoning et al. and Swanson et al. teach the system

of Claim 7. As to Claim 7, none of the references cited disclose, teach or suggest optical input/output connectors of module bypass circuit boards of first and second mass storage modules connected by a fiber optic transmission medium. Claims 8, 9, 17 and 18 depend from Claim 1. Kimura et al. was cited as teaching that each drive bypass circuit board is relatively flat. It is respectfully submitted that Kimura et al. also does not teach, disclose or suggest optical input/output connectors of module bypass circuit boards of first and second mass storage modules connected by a fiber optic transmission medium, as is claimed. It is therefore respectfully submitted that Claims 8, 9, 17 and 18 are novel and inventive over Leshem, Espy, Keaveny et al., Swanson et al., Dekoning, et al., Harvey and Kimura et al.

Claims 25-27, 35 and 36 depend from Claim 19, that recites "wherein the optical input/output connectors of the module bypass circuit boards of the first and second mass storage modules are connected by a fiber optic transmission medium such that signals are communicated between the modules in the form of light." In view of the foregoing remarks, it is respectfully submitted that Claims 25-27, 35 and 36 are novel and inventive over Leshem, Espy, Keaveny et al., Swanson et al., Dekoning, et al., Harvey and Kimura et al. It is therefore respectfully submitted that Claims 8, 9, 17, 18, 25-27, 35 and 36 are novel and inventive over Leshem, Espy, Hillis, Dekoning, et al., Swanson et al., Harvey and Kimura et al., taken individually or together, and that the rejection of Claims 8, 9, 17, 18, 25-27, 35 and 36 on the grounds of obviousness from Leshem in view of Espy, and further in view of Hillis, Dekoning, et al., Swanson et al., Harvey and Kimura et al. should be withdrawn.

In light of the foregoing amendment and remarks, it is respectfully submitted that the application should now be in condition for allowance, and an early favorable action in this regard is respectfully requested.

Respectfully submitted,

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